

Remarks/Arguments:

Claims 1-15 are the pending claims in this application. Claims 7-15 are withdrawn. Claim 1 is currently amended. Claim 16 is cancelled and the subject matter thereof is incorporated into claim 1. No new matter has been added.

Claims 1-6 stand rejected under 35 U.S.C. § 102 as anticipated by or alternatively under 35 U.S.C. § 103 as obvious over European Patent No. 0 812 818 (Ridland et al.). Claim 16 stands rejected under 35 U.S.C. § 103 as obvious over Ridland et al. Applicants traverse these rejections and submit that the currently pending claims are patentable over these cited references for at least the reasons set forth below.

Rejections under 35 U.S.C. § 102

Claims 1-6 stand rejected under as anticipated by Ridland et al. Claim 1 is currently amended to incorporate the limitation of claim 16 where the molar ratio of base to 2-hydroxy carboxylic acid is in the range 0.01 – 0.6:1. Accordingly, Applicants respectfully submit that the rejection of Claims 1-6 as anticipated by Ridland et al. is now moot in view of the claim amendment.

Rejections under 35 U.S.C. § 103

Applicants respectfully submit that a *prima facie* case of obviousness has not been demonstrated. Moreover, even if a *prima facie* case of obviousness has been shown, it has been rebutted because Applicants have demonstrated unexpected and/or critical results in its Declaration of Richard Ward, Ph.D. pursuant to 37 C.F.R. §1.132 (attached hereto).

"To establish a *prima facie* case of obviousness, ... the prior art reference (or references when combined) must teach or suggest all the claim limitations." M.P.E.P. §2143. A *prima facie* case of obviousness may be rebutted by showing unexpected results. See M.P.E.P. 2144.05(III). "The law is replete with cases in which the difference between the claimed invention and the prior art is some range or other variable within the claims. . . . In such a situation, the applicant must show that the particular range is critical, generally by showing that the claimed range achieves unexpected results relative to the prior art range." *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990).

A *prima facie* case of obviousness has not been shown because Ridland et al. fails to teach or suggest a molar ratio of base to 2-hydroxy carboxylic acid in the range 0.01 – 0.6:1. The Office Action states:

Although, Ridland does not teach that the ratio of base to 2-hydroxy acid is 0.01 – 0.6:1, Ridland does teach "Frequently the amount of base used is sufficient to fully neutralize the 2-hydroxy carboxylic acid but it is not essential that the acid be fully neutralized. Therefore, for monobasic 2-hydroxy acids such as lactic acid, the preferred amount of base is in the range of 0.8 to 1.2 mole per mole of 2-hydroxy acid," which shows using less than 1:1, further the reference teaches "in the case of citric acid (a tribasic acid), the preferred amount [of base] is in the range of 1 to 3 moles base per mole hydroxyl acid," which would suggest to the skilled artisan using 0.67-1:1 base per acid equivalent, however the amount of base used would have been determined through (sic) routine experimentation in the art, absent any evidence of unexpected result or criticality for the specifically claimed range.

This cited provision of Ridland et al., however, merely contemplates that the acid need not be fully neutralized. Ridland et al. suggests an amount of base used to neutralize a monobasic acid could be as low as 0.8 moles per mole of base. Thus, the range of amounts of base as claimed do not touch or overlap with the range disclosed in Ridland et al. Moreover, 0.8 or greater is not even close enough to the range of 0.01 – 0.6:1 (at least 25% less than the lowest amount contemplated by Ridland et al.) that one of ordinary skill in the art would have expected them to have the same properties. Accordingly, a *prima facie* case of obviousness has not been shown.

Even if a *prima facie* case of obviousness has been shown, it has been rebutted because Applicants have demonstrated unexpected and/or critical results. As explained in the Declaration of Richard Ward, Ph.D., and shown in the experiments described therein, the molar ratio of base to acid is critical due to (1) the form of the catalyst and (2) its effectiveness during use in forming the polyesters. First, when the composition includes 1,4-butanediol, base to acid ratios at 0.8 or higher formed an undesirable viscous gel, which was unsuitable for use as a catalyst. On the contrary, catalyst compositions including 1,4-butanediol and having a molar ratio of base to acid in the range of 0.01 - 0.6:1 surprisingly formed a hydrolytically stable, clear mobile liquid suitable for use as a catalyst, for example, in polyester-forming processes. For completeness, Applicants note that the same gelling problem did not occur at the higher base to acid ratios when the alcohol used was ethylene glycol. One of ordinary skill in art would understand in reviewing Ridland et al. that a clear liquid catalyst would form when the alcohol

is ethylene glycol and work effectively for producing polyethylene terephthalate (PET). This issue of gelling arose, however, when the inventors of the present invention attempted to use 1,4-butanediol for manufacturing polybutylene terephthalate (PBT).

In any event, polyesters formed using the catalyst according to the invention, in the claimed range of 0.01 - 0.6:1, exhibited a lower T_g (glass transition temperature) and a significantly higher T_n (crystallization temperature) than polyesters prepared from a catalyst outside the claimed range. This is significant because the higher crystallization temperature allows for a wider range of temperatures during melt processing, which is above the T_g and below the T_n , before the polyester structure sets during crystallization. Declaration paragraphs 6-12. Moreover, as explained in the Declaration of Calum Harry McIntosh provided previously, the thermal analysis demonstrated a significant and unexpected rise in crystallization temperature providing for a wider temperature window in processing the polyester. Thus, PET made using a base to acid ratio of 0.01 - 0.6:1 crystallizes more slowly and so provides a wider range of temperatures for thermal processing operations, such as are used in making polyester films and bottles.

Accordingly, Applicants respectfully submit that a *prima facie* case of obviousness has not been shown. Moreover, even if a *prima facie* case of obviousness has been demonstrated, it has been rebutted because unexpected results were found at the lower base to acid ratio of 0.01 - 0.6:1, as claimed. It is respectfully submitted that independent claim 1 is in condition for allowance. Claims 2-6 depend from claim 1 and therefore should each be allowed for at least the reasons set forth above.

Double Patenting

Claims 1-6 are provisionally rejected for nonstatutory obviousness-type double patenting as unpatentable over claims 1-12 of co-pending Application No. 10/432,510. Applicants respectfully submit that the claimed invention is patentably distinct over Application No. 10/432,510. Claim 1 recites a finite range of molar ratio of base to 2-hydroxycarboxylic acid of 0.01 - 0.6:1, which is not claimed in the co-pending application. Application No. 10/432,510 claims a significantly wider and higher ratio of base to acid in claim 8 of 2-12 base to 1.5-3.5 acid (or 0.57 - 8:1). Moreover, the unexpected results described in the Declaration provided herewith applies equally to the disclosure of Application No. 10/432,510. Accordingly, Applicants request withdrawal of the provisional obviousness-type double patenting rejection.

Appln. No.: 10/537,651
Amendment Dated January 4, 2010
Reply to Office Action of August 3, 2009

JMYS-128US

Conclusion

For all of the foregoing reasons, Applicants respectfully request reconsideration and allowance of the claims. Applicants invite the examiner to contact their undersigned representative if it appears that this may expedite examination.

Respectfully submitted,



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Attachment: Declaration of Richard Ward, Ph.D.

Dated: January 4, 2010

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